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THE SEPARATION OF RAILWAY COSTS BETWEEN FREIGHT AND PASSENGERS

SUMMARY

Three aspects of the problem, 346. — Separation of costs between freight and passengers, 348 — Cost separation required by Interstate Commerce Commission in 1888, abandoned in 1902, 349 — Tentative classification in 1915 and discussion thereon, 353 — Partial separation again required in 1916, but suspended on outbreak of war, 354 — A system of separation again established, going into effect January 1, 1920, 355 — Concluding remarks on the general problem, 360

To secure the proper perspective on railway cost accounting it is well to bear in mind: first, that the railway industry supplies varied products, of which those other than transportation proper are logically to be regarded as by-products; second, that problems of cost accounting exist in every phase of railway operation, and differ in kind and extent as the phases vary; third, that the problem varies also according to the point of view of the student and the purpose he has in mind.

Let us develop these three points for a moment. First, the railway industry is one of varied products. True, its principal product is transportation, which is a service rather than a product: transportation of human beings, animals, freight, mail, express parcels, and the like. But in carrying out its function of transportation, a railway produces many other things besides. It manufactures and repairs equipment, for which it maintains elaborate shops, many of them extensive factories with thousands of employees. It operates for its patrons hotels, restaurants, and other similar conveniences. Many railways maintain their own water plants, electric light and power plants, ferries, ship lines, trucking fleets, and the like. The modern railway operates tie-treating plants and chemical and physical laboratories. In fact, the needs of an American railway system are so extensive, so varied, and so vital, that it operates many industries as part of its own primary function of producing transportation. Almost every industry presents some phase of the problem of cost accounting as a standard or measure of efficient and economic operation. A railway system, comprising many industries in one, offers a fertile field for the development of cost accounting methods.

As to the second point, railway cost accounting in its broadest aspect is as extensive and varied as are the several phases of the railway industry itself. Many of the accounting methods employed are the same as in other industries, yet every industry has problems that are wholly peculiar to itself. For example, railway shop accounting methods do not differ greatly from methods employed in similar shops outside the railway field. None the less shop accounting on the railways has developed a literature of its own.

The third point deals with the fundamental purpose of any system of accounts. Every presentation of a method of accounting for railway expenses that shall portray the relative cost of the passenger and the freight business must have as its guide and goal the purpose of the study. Primarily, two principal purposes may be involved. One is to set up a standard of operating efficiency; the other, to provide a basis or standard for rate making. This fundamental difference in purpose has been responsible for much of the controversy over the subject of railway cost accounting. Generally speaking, altho not in all cases, the railways have opposed the installation of cost accounting methods by regulatory bodies; in part perhaps because they feared that methods devised and developed by the railway companies themselves as tests of efficient operation would be utilized instead as standards of rate making, but chiefly because they were not satisfied that accurate and suitable methods had yet been devised. Generally speaking, too, regulatory commissions (federal and state) have favored the installation of some standard system of cost separation; but, perhaps because of the opposition of the railways, certainly because they were themselves groping their way to a clearer understanding of the subject, progress has been very slow.

The purpose of the present paper is not to attempt a survey of all possible topics under the general head of railway cost accounting, chiefly because such an attempt would not present anything peculiar to the railway industry. My effort will be merely to outline the development of that phase of railway cost accounting which pertains particularly to the railway industry — namely, a system of separating railway operating expenses as between the freight and passenger services. It is proposed to discuss, first historically, then analytically, the principle of separation of railway expenses as developed to date.

Let us glance first at the historical record. Section 20 of the Interstate Commerce Act of 1887 authorized a uniform system of railway accounts, and the first returns filed by railways with the Interstate Commerce Commission covered the fiscal year 1888. The report form submitted by the Commission to the railways for that year provided for the separation of costs between passenger and freight. A representative committee of railway accounting officers recommended that the provision be stricken out, but their recommendation was not heeded, and the classification of the Commission directed the railways to charge to the one or the other service all directly assignable costs, and to apportion remaining costs on the basis of train-miles.[1]

Beginning with the statistical report of the Commission for 1888, and continuing through 1893, cost separation statistics were presented in the summary form shown below:

	Cents per ton-mile			Cents per passenger-mile		
	Receipts	Cost	Profit	Receipts	Cost	Profit
1888	1.001	.630	.371	2.349	2.042	.307
1889	.992	.593	.399	2.165	1.993	.172
1890	.941	.604	.337	2.167	1.917	.250
1891	.895	.583	.312	2.142	1.910	.232
1892	.898	.582	.316	2.126	1.939	.187
1893	.878	.579	.299	2.108	1.955	.153
Six-year average	.934	.595	.339	2.176	1.959	.217

Averaging the results of the six years (a rough average, as no attempt is made to give the traffic of each year its proper weight), it appears that the Commission's computed profit per ton-mile was 0.339 cent, or 36.3 per cent, while the profit per passenger-mile was 0.217 cent, or 10 per cent.

In his report for 1892, the Commission's statistician, Professor Henry C. Adams, announced that further attempts at cost separation would be abandoned. He said: " It has been found that not more than half of the items of operating expenses can by any means be assigned to passenger and to freight service. This fact, taken in connection with the fact that the average cost per ton per mile and per passenger per mile, which was obtained upon the basis of the computation in question, was rarely used by commissioners in judging of fair rates, induced the railway commissioners to abandon this classification."[1]

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[1] " The amounts of the separate items are to be apportioned as between freight and passenger traffic All expenses which are naturally chargeable to either freight or passenger traffic should be entered in their respective columns in the report; expenses which are not naturally chargeable to either traffic should be apportioned on a mileage basis, making the division as between freight and passenger traffic in the proportion which the freight and passenger train mileage bears to the total mileage of trains earning revenue The expenses incurred in connection with mixed trains, not herein specifically provided for, will, for the present, be divided as one-fourth to passenger and three-fourths to freight " Classification of Operating Expenses, Interstate Commerce Commission, July 31, 1888

Chairman Cooley, of the Commission, wrote in 1891 as follows: "I understand very well that it is absolutely impossible to so apportion the cost of freight and passenger service as to reach accurate results. . . . I may perhaps with propriety add that I can very well see that the application of the rule does not lead to correct information regarding the cost of passenger traffic considered by itself, and if the matter were exclusively in my hands I should probably make considerable change."

Along the same line is an interesting, I might almost say entertaining, committee report presented to and adopted by the annual meeting of the Association of (state) Railway Commissioners in 1892:

> Every one will admit that if the items of cost of freight and passenger service could be obtained with substantial correctness the information would be valuable. . . . But we have not yet arrived at the point of being able to see how a body of inaccurate statistics, which are supposed to support another body of erroneous deductions, can be of practical value. . . . It is said a uniform basis must be adopted and maintained to secure the benefit of comparisons, but it is difficult to understand how, if one error is vicious and harmful, an accumulation of errors may become salutary; and it is quite as difficult to see how true statistical instruction may be derived by comparing a large number of errors more or less gross with each other. . . . So far, therefore, from the statistics obtained from this division being valuable as affording a criterion for railway rates, we believe that the very fact that this false information is liable to be used is the most cogent reason which could be given for ceasing to furnish a basis confessedly erroneous. A man who travels in the wrong direction is certainly as likely never to arrive at his destination as one who travels not at all.

[1] Statistics of Railways, 1892, pp 86, 87.

At the same time, railway accounting officers, expressing themselves individually and through their association, were strongly in favor of discontinuing further attempts to apportion freight and passenger costs.

Thus the railways, the Interstate Commerce Commission, and the state railway commissions were united at this time in the opinion that the method of cost accounting then in effect was neither accurate, logical, nor helpful. It was accordingly discontinued by the Commission, and the matter lay dormant for twenty years. This may be said to mark the close of the first act in the drama.

The second act opens with a revival of the subject by the Interstate Commerce Commission. Statistical Series Circular No. 3, issued in March, 1914, was a tentative classification prepared for discussion and study. After a hearing in May of that year, the Commission decided to institute a system of separation at the earliest practicable moment.[1] Before doing so, however, it issued a revised tentative scheme of separation in March, 1915 (S. S. C. No. 4), which for the most part followed formulae suggested by representative committees of the railways, but left open for further consideration a proper method of separation for maintenance of way expenses. A hearing was called for May 21, 1915, to consider objections to the proposed formula, as well as suggestions for improving it.

Before discussing this hearing and its results, it should be noted that altho the railways coöperated with the Commission in the development of a formula at this time, they were by no means a unit in favor of any formula whatever. Thus a meeting of the Association of American Railway Accounting Officers in 1913 adopted a lengthy resolution presented by its standing committee on corporate, fiscal, and general accounts, which read in part as follows: " Resolved, that this Committee, after due and deliberate consideration, reiterates that no fixed rule for the division of common expenses between freight and passenger can be devised which will be equitable

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[1] 30 I. C. C. 676–682

to all carriers,
to the same carrier under all conditions, or
to all divisions of the same carrier."

Furthermore, the Commission's circular was careful to state that the special committee appointed by various railway organizations, altho it had made numerous suggestions for improving the Commission's formula, did not recede " from the position which the (railway) accounting officers had previously taken, namely, that no uniform basis can be adopted which will apply equitably under all conditions."

The hearing developed chiefly into a discussion of the four alternative bases for apportioning maintenance of way expenses suggested by the Commission, as follows:

1. The locomotive ton-mile.
2. The locomotive tractive-power mile.
3. The direct charges.
4. The gross ton-mile.

The principal witnesses were railway representatives on the one hand and representatives of the state commissions on the other hand. Discussion centered upon two of the four bases suggested. The railways for the most part advocated locomotive ton-miles as the best basis of apportionment, while the state commissions advocated gross ton-miles. The first method takes the weight of the locomotives, exclusive of tender, and multiplies that by the distance traveled, disregarding weight of train behind the engine; the second method ignores the locomotive, but takes the total weight behind the locomotive, including tare weight of cars and weight of passengers or freight transported.

The opposing points of view were carefully and ably presented, but apparently neither group of advocates was able to convert the Commission, for when its final order was issued June 15, 1915, it frankly confessed itself unable to decide between the methods. In order to furnish a basis for further study of the subject, methods were provided for reports covering both gross ton-miles and locomotive ton-miles. In the language of the order, "It may fairly be said that the facts and arguments presented do not warrant the final approval by the Commission of either the gross-ton-mile or the locomotive-ton-mile at this time. . . . The disputed portion of the expenses will be required to be reported as undivided. Carriers will be required to compile locomotive-ton-mile data, and the relative merits of locomotive-ton-miles, direct charges, estimated gross ton-miles, or modifications thereof can be further considered with the aid of statistics thus made available."

For the year 1916, therefore, railways of Class I reported to the Interstate Commerce Commission their operating expenses separated as follows:

Total expenses.
Expenses related solely to freight service.
Expenses related solely to passenger and allied services.
Expenses related in common to both services.
  Apportioned to freight.
  Apportioned to passenger.
  Not apportioned.
Expenses not related to either service.

In the Commission's classification on which this separation was based, provision was made either for direct assignment or for apportionment of virtually all expenses other than those in the maintenance of way group. With regard to maintenance of way, expenses that could be directly assigned or apportioned (of which there are few) were to be so reported, while the remainder were to be reported merely as " undivided." Briefly described, the classification provided first, that expenses clearly pertaining to one or the other service should be so charged (i. e., direct charges); and second, that expenses common to both services should be apportioned on certain definite bases laid down by the Commission, with the proviso, however, that a large part of the common expenses under maintenance of way should not be apportioned on any basis whatever.

Taking the summary for Class I roads for 1916 as shown in the Commission's *Statistics of Railways* for that year, total expenses related solely to freight services were 47.5 per cent, and those related solely to passenger service were 16.5 per cent, of all operating expenses. Of the expenses common to both freight and passenger services, an amount equivalent to 13.2 per cent of total expenses was apportioned to freight, and 5.1 per cent to passenger service. The accounts " not apportioned " represented 17.5 per cent of the total. That is, 64 per cent, or nearly two-thirds, were directly assigned; 18.3 per cent, or nearly a fifth, were apportioned; while the remaining 17.5 per cent were left undivided. These were the results from the 1915 classification.

Of the maintenance of way expenses 11.4 per cent were assigned directly, 11.7 per cent were apportioned, and 76.9 per cent were left undivided.

Hardly had this partial method of separating expenses been installed when the United States became involved in the war. As a measure of relief from the burden of clerical work involved in the preparation of detailed statistical reports to the interstate and state commissions, the railways petitioned for a modification of various of the requirements. Among others, the separation requirement was so modified for the year 1917 as to suspend the necessity of apportioning any of the expenses common to both services. The suspension was continued through the years 1918 and 1919.

Beginning January 1, 1920, however (and here begins the third act), the Commission reëstablished a separation of operating expenses, along the following general lines:

First, all expenses directly related to the freight and passenger services are so assigned. This direct-charge method will apply to 100 of the 196 primary expense accounts, representing 66.6 per cent, or almost exactly two-thirds, of total operating expenses. Second, certain other expenses will be apportioned on definite bases laid down by the Commission. For example, yard maintenance will be apportioned according to switching locomotive miles, dispatching trains on the basis of transportation train miles, track maintenance on the basis of locomotive fuel cost, and so on. There are 44 of these accounts, representing 14.9 per cent of total expenses. Third, all other expenses are to be separated in the average proportions of other accounts in their respective group or class, as defined by the instructions. This is the basis prescribed for 52 of the 196 accounts, representing 18.5 per cent of total expenses. In effect, the procedure is to find the average percentage under the first two groups, namely, directly assigned charges and proportional apportionments, and then to apply that percentage to total operating expenses as a whole.[1] So far as affecting the average is concerned, the third group of accounts play no part whatever; they are simply brought in to make the process complete.

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[1] This statement is not strictly accurate, of course, but so many of the accounts in this group are general accounts that are to be distributed in the same proportions as other accounts in the same class, that the statement approximates accuracy

Most important in the new classification is the adoption of the fuel-cost basis for apportioning the greater part of the track and some of the other expenses in the maintenance of way group. This is frankly a new departure, but, under a test conducted by the Commission, was found to produce percentages lying midway between the results under the locomotive ton-mile and the gross ton-mile bases.

It is clear, therefore, that while the classification made effective this year is more nearly complete than that of 1915, in that no items are to be reported as undivided; and while more definite bases are provided for many of the accounts than formerly (such as the cost-of-fuel basis applied to a large proportion of the maintenance of way expenses), yet it is far from being a complete or satisfactory system of cost accounting. This fact is frankly admitted in an informal memorandum recently issued by the Commission's statistician, from which are quoted the following extracts:

> No one has proposed a method (for dividing common maintenance of way expenses) which can be demonstrated to be mathematically exact. Consideration should make it clear that the matter is too complex to permit of any exact solution.

Again:

> To measure each one of the many influences on track expense exactly in figures under the varying conditions existing on the roads seems a hopeless task notwithstanding decades of discussion. It seems desirable to have a method adopted that is the most plausible in theory and practical in application, even if it is not free from all objections.

Then, after discussing the cost-of-fuel basis, the memorandum continues:

> But with reasonable accuracy in accounting, the method cannot be very far wrong for obtaining relative figures. No known method is free from objections.

To this may be added the following brief quotation from the Commission's formal decision in the matter of a system of cost separation:

> The assumption that railway cost accounting cannot be made sufficiently accurate for useful consideration in dealing with rates does not seem warranted. Altho not possible 20 years ago, it would appear that at the present time approximately two-thirds of the operating expenses of a railroad can be separated in a reasonably satisfactory manner. The separation of the remaining one-third is useful if a basis is selected which equitably measures the use which either service makes of common facilities [1]

To sum up the historical record, we find that for six years during the first decade of the Commission's life a crude attempt at cost separation was made, but was abandoned by unanimous consent of all parties at interest. For a brief period prior to our entry into the war the attempt was revived, but had only partial application, the bulk of the maintenance of way expenses being omitted from the apportionment. We now have the attempt revived a second time, with much closer approximation to accuracy and completeness, but still on a method admittedly inexact and open to objection. How successful the method shall be depends on the future, and no definite opinion can be ventured until the results are in hand for at least the first year under the new classification.

We come now to a brief analysis of methods of cost separation, and to the general meaning of the effort to install such methods. I cannot here attempt a detailed study of theories of rate making, or of other considerations that are present in this problem. The field has been ably covered in articles by Lorenz, Cunningham, Cooke, Olmsted,[2] and others. My sole effort will be very briefly to appraise the value of the record to date, and to present some inquiries as to future progress.

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[1] 30 I C C 679

[2] M O Lorenz, "Cost and Value of Service in Railroad Rate-making," Quarterly Journal of Economics, February, 1916, W J Cunningham, "The Separation of Railroad Operating Expenses between Freight and Passenger Services," ibid., February,

The outstanding difficulty in any attempt at railway cost accounting is to apportion to the freight or the passenger services those expenses that are common to both services. It is clear that a number of accounts must pertain exclusively to one or the other service. " Loss and Damage Freight " is clearly assignable to the freight service, the cost of operating sleeping cars to the passenger service, and so on.

In his illuminating analysis of this subject Cunningham divides railway costs into three general groups, as follows:

1. Those that may be definitely and accurately allocated. That is, direct charges.
2. Those that are susceptible of apportionment on some basis which will approximately represent the facts. That is, indirect charges susceptible of approximate separation.
3. Those that defy even approximate apportionment; that is, joint costs very difficult to separate.

Professor Cunningham listed twelve bases of apportionment used or suggested from time to time, as follows (and I may add that he did not exhaust the possibilities):

1. Train miles.
2. Train miles plus switch locomotive-miles.
3. Gross ton-miles.
4. Road locomotive-miles.
5. Road and switching locomotive-miles.
6. Locomotive ton-miles.
7. Car-miles.
8. Train miles plus car-miles.

1917, M L Cooke, "True Cost-fixing — What it Can Do for the Railroads," Annals, November, 1919, A S Olmsted, "Do 'Cost-of-Transportation' Exhibits in Railroad Rate Cases Show Cost?" Ibid , January, 1916

9. Weighted gross ton-miles plus locomotive-miles.
10. Direct expenses.
11. Operating revenues.
12. Tons of fuel consumed by locomotives.

I quote this list in full, more to indicate how many different methods or bases have been proposed from time to time, than to lend to a single one of them any suspicion of being a serviceable unit. In fact, serious question has been raised by Olmsted as to the value of *any* method of apportionment. He says: " Allocation (i. e., of direct charges) is the assignment of facts; apportionment is the determination of policy. The former concerns itself with what is; the latter with what should be. . . . Allocation aims to find what each service costs; apportionment aims to determine what each service ought to pay."

Whether we agree with Olmsted or not, there is little question that every form of apportionment is open to some objection. It smacks of the effort to raise one's self by the boot straps. This is especially the case where costs are apportioned according to other costs, rather than according to physical service units. Whereas a rough-and-ready method of apportionment may furnish a railway executive with information regarding the operations of his road that will serve as a standard of judgment from year to year as to the *relativity* of costs, it is far from certain that even a more refined method would supply exact data as to actual *unit* costs. This is particularly true when the same method is applied (again quoting the railway accounting officers)

> " to all carriers,
> to the same carriers under all conditions, and
> to all divisions of the same carrier."

It certainly does not seem without significance that the railways, nearly half of whom maintain some form of cost accounting for efficiency purposes on their own systems, have for thirty-two years been quite generally opposed to a uniform system of cost separation applied to all railways alike. Their principal objection, as we have seen, is based on their skepticism as to the practicability of a uniform method.

Let us suppose, however, that a complete separation is arrived at, what assistance will it render to regulatory bodies or to the railways themselves ?

In the first place, separation between freight and passenger expense will throw some light on the heated and prolonged controversy as to whether the freight business is or is not carrying the passenger business; that is, whether passenger service is being operated at a loss, which must be made up from the profits on freight transportation.[1] Even were this conclusively proven by the facts, it is a question whether the state of public opinion regarding the high level of passenger rates, expressed in many general ways and often written into the laws of the respective states, would not prevent regulatory commissions from so adjusting passenger rates as to force the passenger service to carry its share of the cost of transportation. Furthermore, even if legally feasible, reasons of expediency might lead the Commission to pause before disturbing the level of passenger rates. Different railways might show differing results, and what the Commission would be obliged to consider would be the average for all roads. The rates of such railways as differed from the average could not be changed without disturbing the whole competitive fabric of rates.

Turning to the freight service, the point just made becomes even more emphatic. Not only would we have an average of roads, but also an average based on countless commodities, and the question arises as to what assistance separation of expenses would afford to a body desiring to distribute rates equitably over all regions and all commodities. This point was well expressed as long ago as 1892 by H. M. Putney of the New Hampshire Commission, when he said: " It doesn't amount to anything to us when trying to fix a fair coal rate from the seaboard to our interior towns to know that the average cost of hauling all freight, including coal, baby carriages, benzine, silk and everything else, is a cent per ton-mile." The Commission itself has put in a mild disclaimer on the rate-making utility of cost separation, in the following language: " It is erroneous to suppose that the Commission is interested in statistics of this sort merely for the purposes of rate making. . . . It is the duty of the Commission to keep itself informed regarding the manner in which the railway business is conducted, and a knowledge of the variations in unit costs is valuable to us even if no rates are based thereon."[1]

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[1] Our table on page 319 indicated that during the six years 1888–93 the profit from freight transportation was 36 3 per cent, as compared with 10 per cent in the passenger service. This result should not be accepted as either exact or conclusive

Still other difficulties arise when it is attempted to separate costs as between line and terminal hauls, as between state and interstate traffic, and the like. The terminal separation would be necessary under any mileage scale of rates, yet such a separation cannot be made without carrying the work of apportionment under the present classification very much farther. Efforts of this sort have been made, notably in certain state cases in Wisconsin, Oklahoma, and Ohio, but they involved months of most intensive investigation and compilation.

In brief, and finally, it appears that for detailed rate-making purposes, whether freight rates or passenger rates, no scheme of cost separation yet developed can be helpful except in the most general way. The new classification will add considerably to the sum of information possessed by the student of railway affairs, and may well assist the railways themselves in furnishing standards by which to judge the relative efficiency of operation. It will unquestionably give the Commission valuable data along the same line. It will develop material for further discussion of the cost of service, value of service, and other factors in the philosophy of rate construction. For all these purposes it will be useful, but for purposes of detailed rate making, I feel that the complicated factors entering into the problem prevent this particular phase of cost accounting from attaining great utility.

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[1] 30 I C C. 679.

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